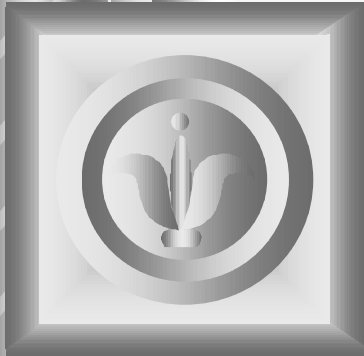


Mercury Waste Treatment Evaluation



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1/16/02



Status Summary

- **EPA has participated with DOE in 3 recent studies to evaluate waste stability.**
- **A study of radioactively contaminated soils has been completed.**
- **Studies of a surrogate waste and elemental mercury are near completion.**



Study Outline for both Bulk Elemental and Mercury Surrogate Studies

- **Vendors received wastes for treatment and returned treated wasteforms for assessment.**
- **The treatments entailed amalgamation and/or stabilization using proprietary reagents.**



Study Outline, Continued

- **Vendors prepared duplicate batches**
- **The treated wasteforms were required to pass TCLP to be included in the study.**



Study Outline, continued

- **Measured total Hg, TCLP, Constant pH Leaching**
- **Hg vapor pressure (ORNL)**



Metal Solubility is controlled by:

- **pH**
- **Liquid/solid ratio**
- **Redox conditions**
- **Major ions**
- **Particle size**
- **Exposure time**

Our studies focus on pH.



Constant pH Leaching Protocol

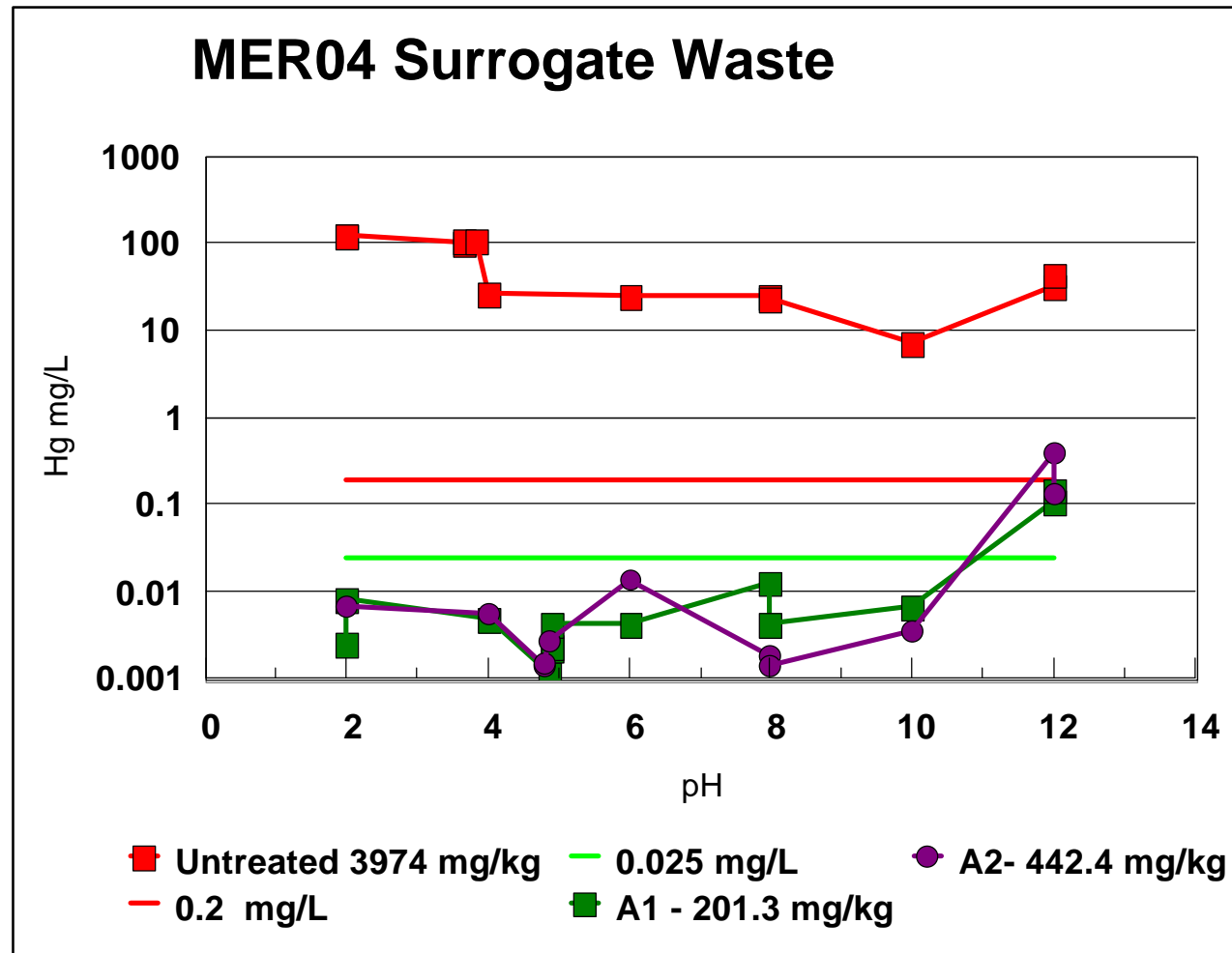
- **Treated wastes exposed to fixed pH conditions (pH 2 – 12) for 14 days.**
 - Leachate to solids 20:1
 - 9.5 mm solids
- **Duplicate leach experiments at pH 2, 8, and 12.**
- **Leachates were analyzed following general laboratory QA/QC.**



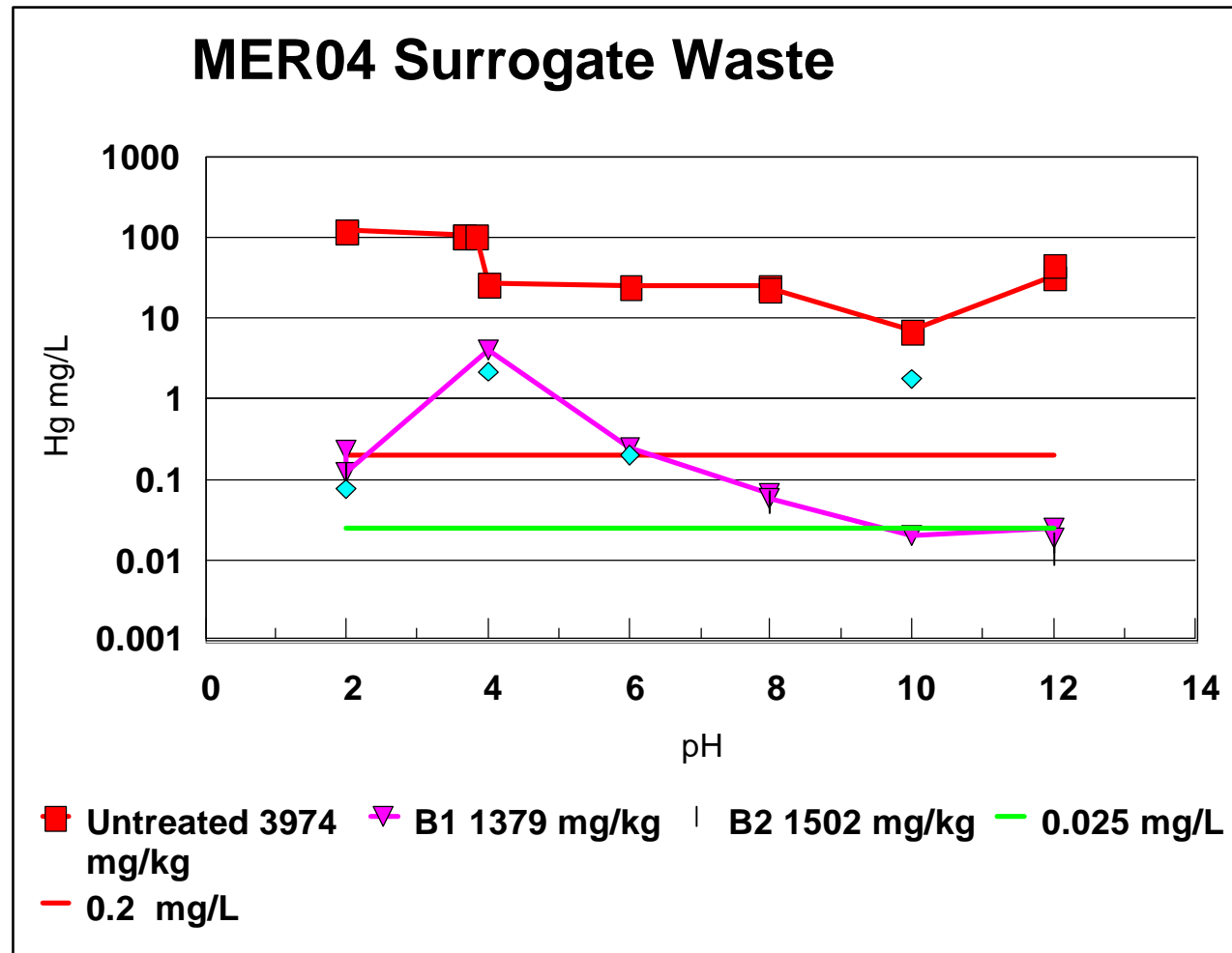
Mercury Surrogate Waste Study

- **Multiple forms of mercury (5000 mg/kg) in sludge of diatomaceous earth, aluminum hydroxide, ferric chloride, and sodium chloride.**
- **Elemental mercury, Mercury chloride, Mercury nitrate, Mercury oxide, Phenyl mercuric acetate**
- **TCLP 110 mg/L average**

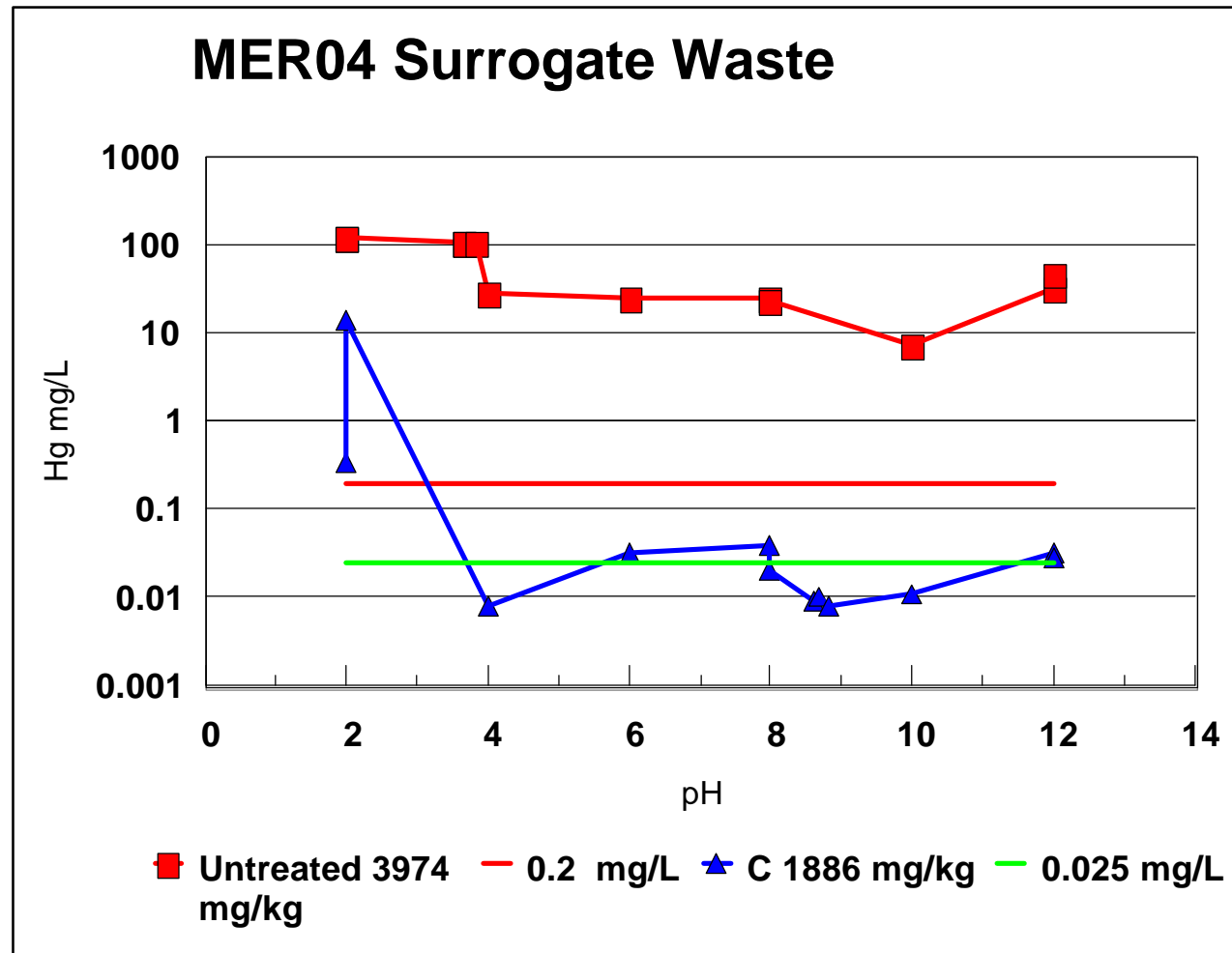
Process A



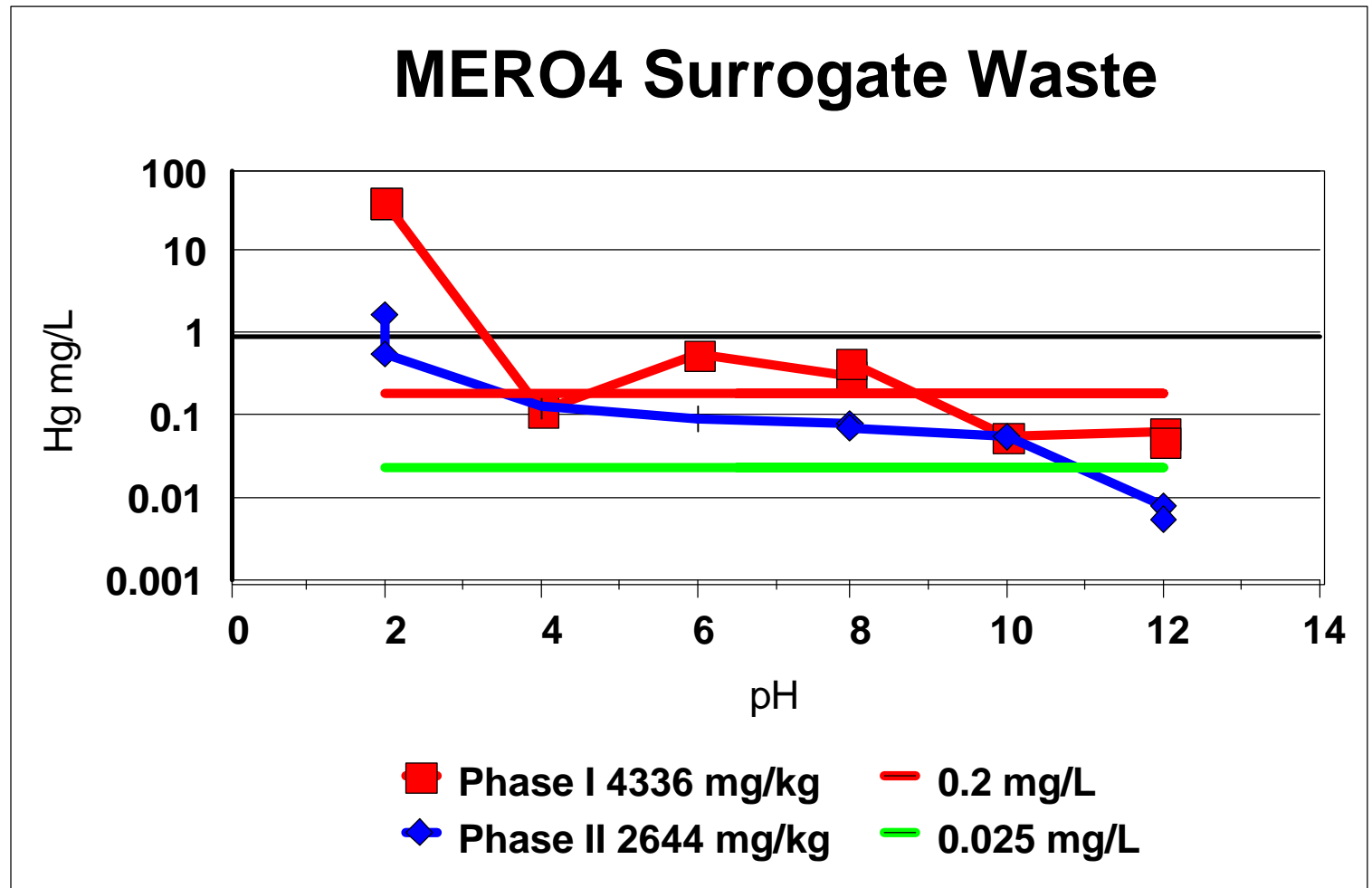
Process B



Process C



Process D

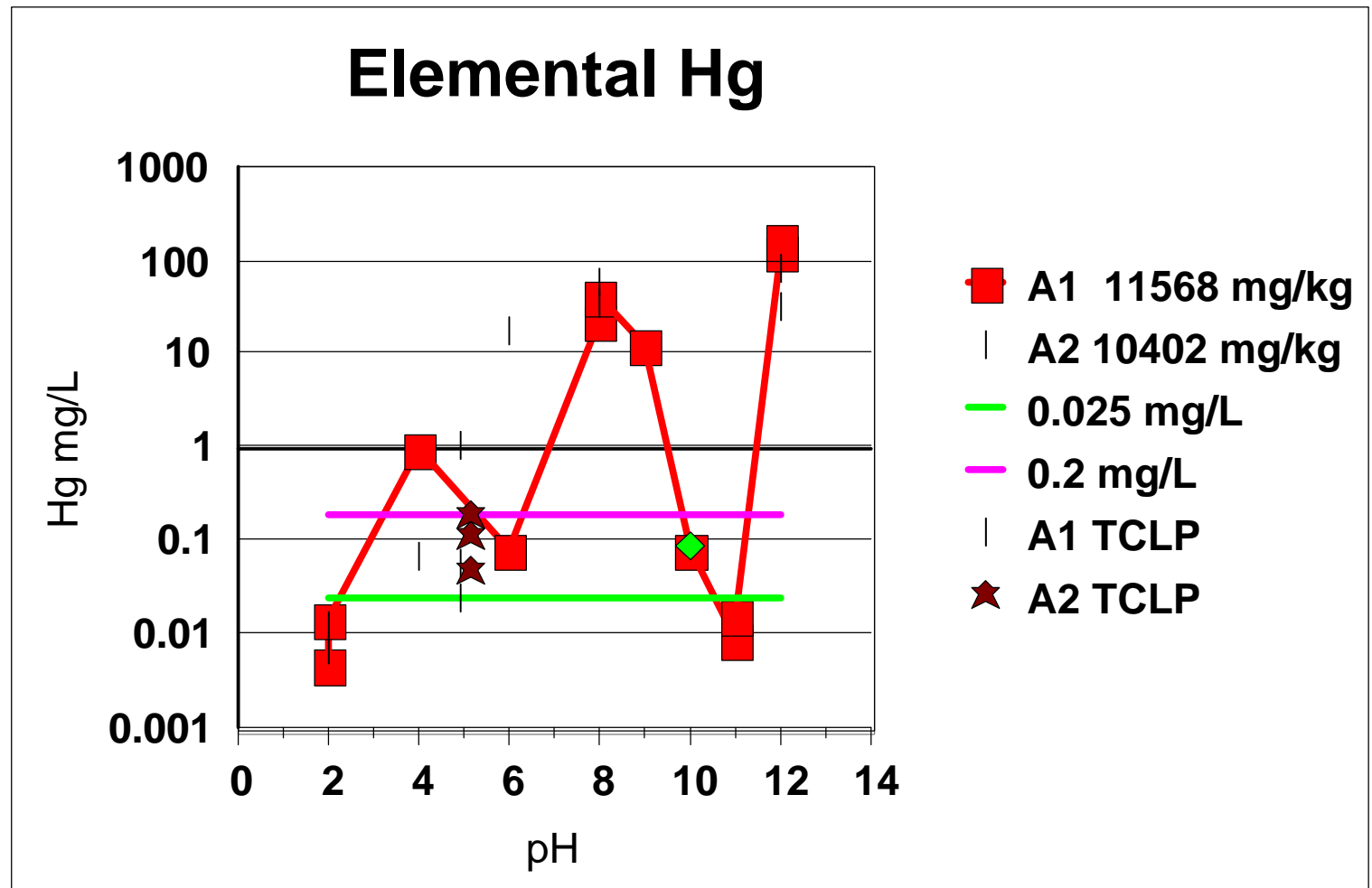




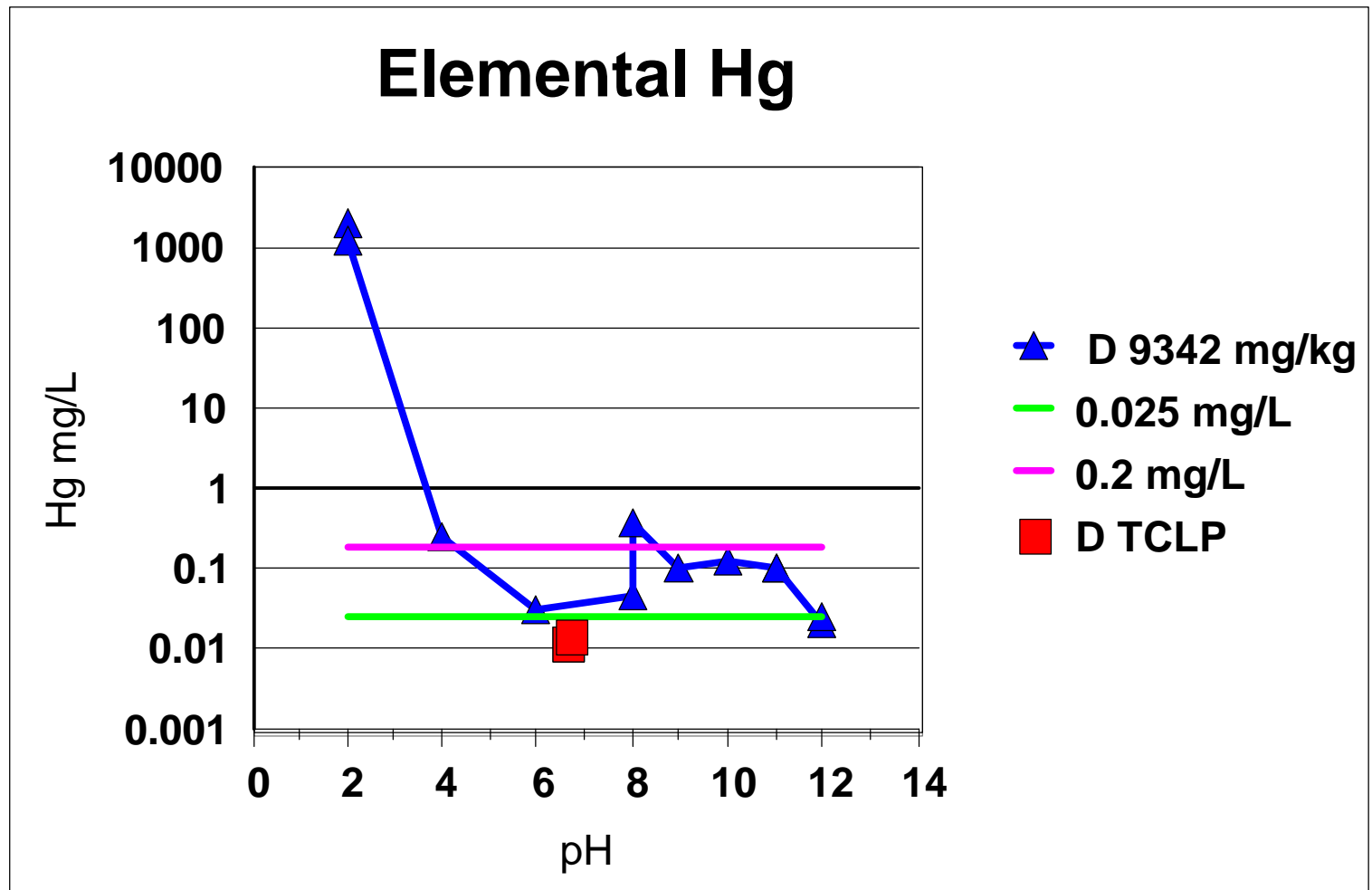
Bulk Elemental Treatment Study

- **Same leaching protocol**
- **Same Vendors**
- **Treated bulk mercury product**

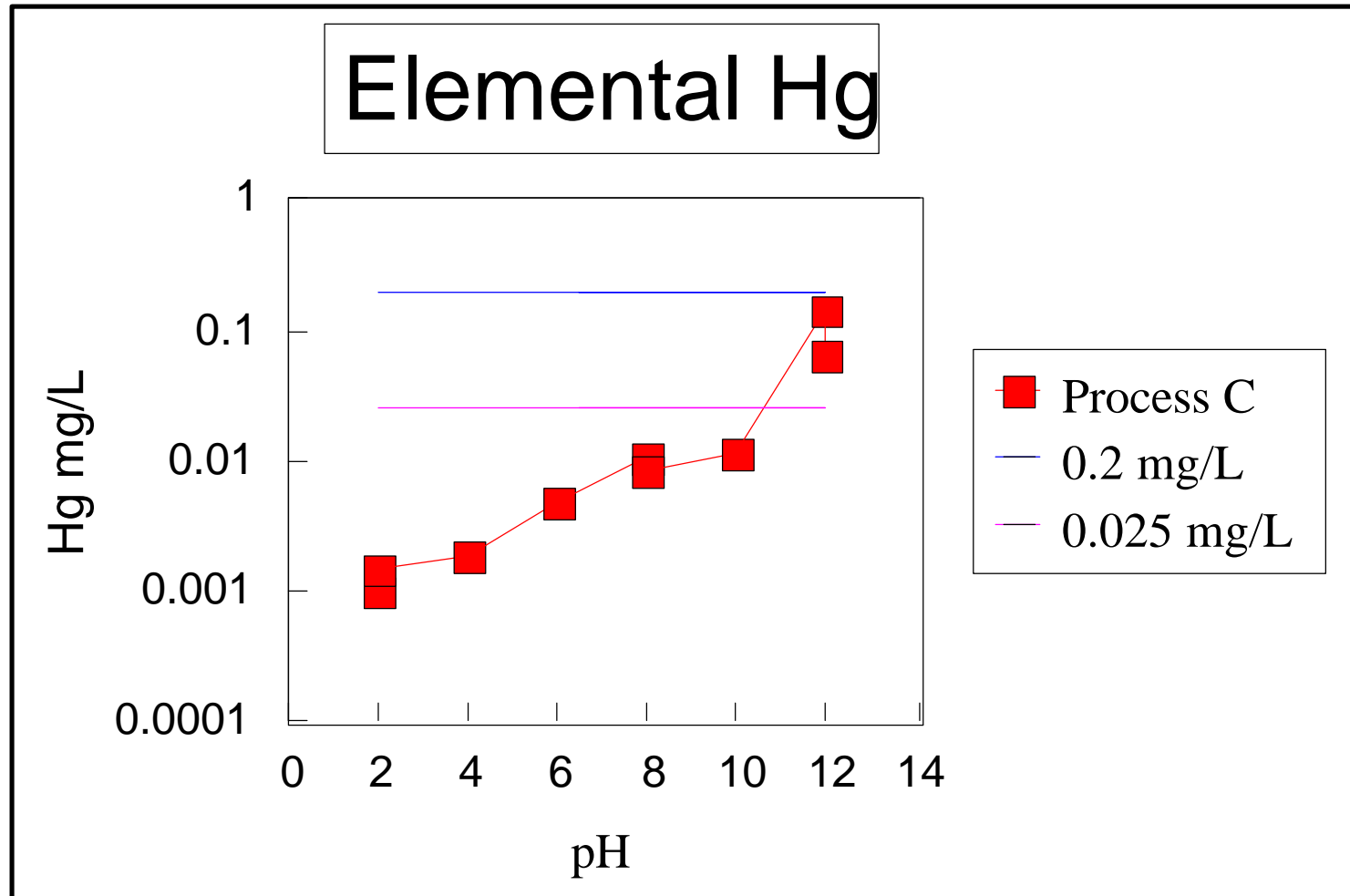
Process A – Bulk Elemental



Process B – Bulk Elemental



Process C- Bulk Elemental





Next Steps

- **We are in the process of analyzing the data.**
- **Not ready to leap to conclusions.**
- **EPA will notice the studies in a NODA in 2002.**